

OBSERVATIONS

On the BILLS of

MORTALITY,

In CARLISLE, for the YEAR 1779.

THE advantages which may be derived from accurate registers of Mortality, are thus illustrated by an ingenious Philosopher and Physician; "The establishment of a judicious and accurate register of the births and burials, in every town and parish, would be attended with the most important advantages, medical, political, and moral. By such an institution, the increase or decrease of certain diseases; the comparative healthiness of different situations, climates, and seasons; the influence of particular trades and manufactures on longevity; with many other curious circumstances, not more interesting to Physicians, than beneficial to mankind, would be ascertained with tolerable precision. In a political view, exact registers of human Mortality are of still greater consequence, as the number of people and progress of population in the kingdom, may in the most easy and unexceptionable manner, be deduced from them. They are the foundation likewise of all calculations concerning the values of assurances on lives, reversionary payments, and of every scheme for providing annuities for widows, and persons in old age. In a moral light also such *Tables* are of evident utility, as the increase of vice or virtue may be determined, by observing the proportion which the diseases arising from luxury, intemperance, and other similar causes bear to the rest; and in what particular places distempers of this class are found to be most fatal." *Percival's Essays, vol. 2d.*

CARLISLE is situated in Latitude 54. 55 North, and is surrounded by a wall about a mile and a quarter in circumference. The situation is rendered exceedingly pleasant by its vicinity to three beautiful Rivers, with which it is almost surrounded. *viz.* The *Eden* on the north east side, *Peterel* on the south east, and *Caldew* on the north west. CARLISLE contains two Parish Churches, *viz.* *St. Mary's* and *St. Cuthbert's*, beside two Presbyterian, and a Quaker's Meeting House. A very considerable Linen Manufactory is carried on in this City, and the Printing of Calicoes is still more extensive. The air about CARLISLE is pure and dry, the soil chiefly sand and clay. No marshes or stagnant waters corrupt the the atmosphere; its neighbourhood to a branch of the sea, and its due distance from the mountains on all sides render the air temperate and moderate.

In July 1763, at the request of the late Lord Bishop of CARLISLE, the inhabitants were numbered with great care and attention by the *Rev. Mr Richardson*, the *Rev. Mr Simpson*, and *Mr Alderman Hodgson*. There were at that time in the City and Suburbs, 1059 families, and 4158 inhabitants.

In January 1780, a very careful and accurate survey was made by *Mr Stanger* and *Mr Howard*, under my own inspection. When there were in the district before surveyed, 891 houses, 1605 families, and 6299 inhabitants. For a more particular account of the survey see Tables I. II. III.

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This astonishing increase of 2141 inhabitants, which is above half of the original number, in the small space of seventeen years, may in some measure be attributed to the establishment of manufactories for the Printing of Calicoes. About the year 1761, *Mr Brummel* introduced this kind of manufactory; and notwithstanding the many difficulties, which naturally attend any new institution, by his activity, perseverance, and abilities he surmounted them all, and the art is now brought to great perfection. Soon after, several other gentlemen followed his example. There are at present four companies who daily employ about eight hundred industrious poor, in this Manufactory.

This increase of population too has taken place, during that very period, in which *Dr Price* asserts the depopulation of *Great Britain* to have been rapid and progressive. And what makes this increase more remarkable, *CARLISLE* has during the whole period alluded to, been constantly supplying the army, the navy, the metropolis, and even the distant regions of *India* with her hardy, active, and enterprising sons.

From Tables No. II. and IV. we can with pleasure demonstrate the extreme salubrity of *CARLISLE* even in a very unhealthy year; a year in which no less than 129 persons were cut off by two epidemic disorders, *viz.* the Small Pox and Scarlet Fever. By the Bills of Mortality published in different towns in *England*, as well as the Continent it appears on an average, that in Vienna about 1 in 19 and a half of the inhabitants die annually; in London 1 in 20 and three quarters; in Edinburgh 1 in 20 and four fifths; in Leeds 1 in 21 and three fifths; in Dublin 1 in 22; in Rome 1 in 23; in Amsterdam 1 in 24; in Breslaw, 1 in 25; in Berlin 1 in 26 and a half; in Northampton and Shrewsbury 1 in 26 and a half; in Liverpool 1 in 27 and a half; in Manchester 1 in 28; in Chester 1 in 40; but in the year 1774 when the Small Pox were very general and fatal 1 in 27; and in the Parish of Sedburgh in the County of York 1 in 37 and a half; and in Blandford Forum in Dorset, 1 in 39; in *CARLISLE* this year 1 in 30 and three ninths.

Tables No. III. and V. are of the utmost importance to the Physician, the Politician, and the Calculator of Annuities, and to every one who has the health and happiness of himself and family at heart. They at one view shew what diseases are most incident and fatal to particular periods of life. They clearly demonstrate as far as one year's observation can have weight, what periods of life are the most healthy, what are the most obnoxious to disease.

Thus we see in *CARLISLE* one in 6 and nine tenths nearly, of all the inhabitants under 5 years old, die annually; betwixt 5 and 10 years old 1 in 64 and six sevenths; 10—15, 1 in 119 and one sixth; 15—20, 1 in 168 and three fourths; 20—30, 1 in 132 and four fifths; 30—40, 1 in 146 and one sixth; 40—50, 1 in 95 and one third; 50—60, 1 in 58 and four fifths; 60—70, 1 in 24 and one third; 70—80, 1 in 13 and three fifths nearly; 80—90 1 in 4 and five sixths; and between 90 and 100 years exactly 1 in 5. As no particular epidemic disease occurred last year which had any considerable effect on the lives of adult persons, it is apprehended these calculations for the periods above 10 years old, will not be attended with much variation in other years.

That women in general live longer than men, is almost universally agreed, and the following observations tend much to confirm the truth of this opinion. During the last year 12 persons died between 80 and 90 years old, 8 of these were females, and between 90 and 100, 2 died, both females. See Table IV. In Table III. we see two people are above 100 years old and these likewise are females.

Table II. which contains the number of Husbands, Wives, &c. Shews how inferior in number Widowers are to Widows. There are above four Widows to one Widower, an astonishing

disproportion, in what manner is it to be accounted for? The following causes are conceived to operate considerably.

I. Men are in general more intemperate than women. II. They are exposed to greater hardships and dangers. III. Widowers perhaps in general have greater opportunities of getting wives, than widows have of getting husbands. IV. Widows have a greater propensity to live in towns than widowers. V. and lastly, The constitutions of males, as fitted for more violent and laborious exertions, are firmer and more robust than those of females; their muscular and nervous fibres, may therefore be supposed to become stiff, rigid, and incapable of performing the functions necessary to health and life sooner than those of females, both on account of their original texture, and the friction which must necessarily occur from laborious exercise. But from whatever causes the difference of longevity betwixt males and females may arise, the fact itself is sufficiently ascertained by Table IV. where we find that between the ages of 60 and 70, altho there are a greater number of wives than husbands, yet 11 husbands and only four wives have died, and of all different ages 29 husbands and 16 wives.

The Table of Deaths and Diseases No V. is as accurate as circumstances and the situation of things would possibly admit. With respect to the Small Pox, and Scarlet Fever, their symptoms and marks are sufficiently evident to prevent any ambiguity. 24 have died of unknown diseases, which is a great number, but which must ever be the case at CARLISLE where many of the lower class (although they may have advice gratis) never call in medical assistance.

Only seventeen have fallen victims to Consumptions, a number but small, when compared with the number, which usually die of that disorder in other towns, and still smaller when we consider how many are employed in the manufactories of weaving and Calicoe printing*, where they continually breathe air by no means the most pure; and where they are subject to sudden alterations of heat and cold. 5 persons have died of this disease between 20 and 30 (see Table No V.) which confirms the general observation, that during that period of life people are most liable to Consumptions. It therefore behoves such to be very cautious upon catching cold, least by neglect and delay, a complaint which at the beginning might have been easily removed, should gather strength, and at last terminate in a fatal disease.

Three died of Dropsy (*viz. Anasarca*) which in all was evidently occasioned by excessive intemperance. Nervous and putrid fevers are not very frequent; no more than five have suffered by both these diseases, which must appear somewhat astonishing to one who knows how many inhabitants there are of the lowest rank, who are crowded in close and small apartments where they sleep, eat, and prepare their victuals; whose food can not be the most nutritive; who seldom change their cloaths; and who pay but little attention to cleanliness. May not the streams of water, which fortunately run near the most crowded parts of the town, tend to purify the air and prevent putrid fevers.

Agues or intermittent fevers are scarce ever known, a strong proof that the effluvia arising from marshes is the principle source of that disease.

In February, a poor girl either for some real, or imaginary complaint, was advised by an acquaintance as ignorant as herself, to take a large quantity of steel filings, which had been procured from a White Smith, or Watch-Maker. Not long after she had taken them, she

* Notwithstanding the impurity of the air breathed by Calicoe Printers, and the sudden changes of heat and cold which they are subject to, yet men following that business, are observed to be very healthy. May not this be owing to the acid steams continually exhaling in a Print Shop?

was seized with pains in her stomach and bowels, which soon increased to a most violent degree. Every remedy which could be supposed useful either in a severe cholic, or inflammation of the stomach, was tried, but in vain. She continued in the greatest agony for two days and then expired.

During her sickness she was repeatedly asked, if she could assign any cause for her disorder, but she always answered in the negative. Soon after her death, however, some steel filings were found in her room, and another servant in the house, on being examined, confessed that the deceased had taken three tea spoonfuls mixed with treacle, a few hours before she began to be ill. Three tea spoonfuls of the filings which were found, weighed six drams and a half, and upon examining them with a magnet, I found a quantity of lead and some copper filings. Had the steel been pure, the quantity alone was sufficient to have produced fatal effects, but here no doubt the lead and the copper would add considerably to its acrimony.

Let the death of this unfortunate young woman be a caution to others; and let Watch-Makers and White Smiths be careful to whom they sell steel filings, especially till they are separated from every impurity by the loadstone or some other method.

During this year two epidemics raged with uncommon violence, and swept off a great number of children, viz. the Small Pox and a species of the Scarlet Fever. As the *Scarlatina Anginosa* or Scarlet Fever and Sore Throat is rather an uncommon disease, and not perfectly understood, it will not be improper to take notice of it in this place. The limits, however, of this sheet, will by no means admit a thorough discussion of a disease, which has within these two years been so general and so fatal to children. I shall content myself with defining the Scarlet Fever and Sore Throat as it occurred at CARLISLE; afterwards attempt to point out its nature; the symptoms by which it is to be distinguished from other diseases; its terminations; and lastly its method of cure. This epidemic made its appearance in July, was at its *acme* during September and October, and gradually abated till the latter end of December, when it almost entirely disappeared.

DEFINITION.

The Scarlet Fever and Sore Throat, is a contagious inflammatory fever. On the second day of the fever, the throat becomes stiff and sore, attended with some difficulty of swallowing; on the third, sometimes not till the fourth, the face begins to swell and grows florid; this swelling and redness, soon become so universal, as to make the whole body resemble a boiled lobster in colour. On the seventh, or eighth day, the swelling and scarlet colour gradually abate, and the scarf skin becomes rough, and peels off in small branny scales.

DIAGNOSTIC SYMPTOMS.

To an inaccurate observer, this disease may seem to bear a very near resemblance to many eruptive fevers; the intelligent and attentive practitioner, will however, find no difficulty in discriminating it from all, but the *Cynanche Maligna* or Putrid Sore Throat, which especially at the commencement of the Epidemic will be no easy matter. The distinction however, is extremely necessary, as the method of cure is almost diametrically opposite. We

shall therefore attempt it. Both diseases are highly contagious; both attended with a fever; both with an affection of the throat; and both with an eruption of the skin. Yet each disease has its peculiar fever; peculiar sore throat; and peculiar eruption. In the *Cynanche* (both for the sake of brevity and perspicuity we shall make use of the Generic term) the fever is constantly accompanied with a weak, quick, small and unsteady pulse. In the *Scarlatina* the pulse is quick, full, but seldom hard. In the *Cynanche* the throat and fauces are full of creeping ulcers, covered with brownish ash coloured sloughs. In the *Scarlatina* there are seldom any ulcers, but often whitish mucous sloughs sometimes extending over the whole tongue and inside of the mouth, which may be easily washed off with a little wine and water. The eruption in the *Scarlatina* is florid, universal, smooth, seldom prominent, and always dry. In the *Cynanche*, neither so florid, nor so universal, and in general rough, prominent, and often moist. The *Cynanche* chiefly affects the weak and delicate; females, more frequently than males; whereas robust, and plethoric children are more subject to the *Scarlatina*. The *Cynanche* is almost constantly accompanied with a fetid breath, and an acrid corrosive humour is discharged from the mouth, nose, and anus, which excoriates the skin. These disagreeable symptoms rarely occur in the *Scarlatina*. In the *Cynanche*, the colour of the blood is florid, its texture loose and tender. In the *Scarlatina* it is firm and covered with a buffy coat. The *Cynanche* is cured by tonics and antiseptics; bleeding, purging, and emetics, are universally hurtful. The principal remedies to be depended upon in the cure of the *Scarlatina*, are blood letting, emetics and the antiphlogistic regimen. Lastly the *Cynanche* is highly putrid. The *Scarlatina* is inflammatory, as may be easily deduced from the following circumstances, 1st. The robust and plethoric are more subject to it than the weak and delicate. 2d, There is a manifest swelling, redness and inflammation of the skin. 3d, The pulse is full, and generally rises after the first bleeding. 4th, The surface of the blood is covered with a firm buffy coat. 5th, In cases, where the lancet was not freely used, suppurations sometimes occurred in the throat. 6th, and lastly, evident advantages were derived from bleeding.

T E R M I N A T I O N S.

The Scarlet Fever and Sore Throat sometimes terminates in Dropsies, Deafness, Tumours and Suppurations in the Neck.

M E T H O D O F C U R E.

From the definition already delivered, we learn that the Scarlet Fever and Sore Throat is a contagious disorder. The occasional or immediate cause must therefore necessarily be a peculiar kind of poison, of a volatile nature, readily mixing with the air. And many circumstances render it probable that it is first applied to the mucus membrane which lines the mouth, nose, fauces, stomach, &c. Emetics therefore are indicated, as remedies the most likely, to expel either the whole or a part of this poisonous matter; and if they were used soon after the application of the poison, it is probable the disease might in many cases be prevented. It is a certain fact, they have been employed with great advantage, and ought never to be omitted. The efficacy of Emetics does not however, by any means solely depend on their expelling the contagious virus; they unload the stomach, often gently move the belly, and have considerable effect in producing a copious sweat, and in removing a spasm of the small vessels on the
fur-

surface of the body, which is a part of the proximate cause of all Fevers. *Emetic Tartar* dissolved in water appears to be the best vomit.

Of all the remedies made use of in this Epidemic, none were of more real advantage than bleeding, which was sometimes repeated three or four times; so great was its efficacy, that I believe not one patient died, who lost a sufficient quantity of blood early in the disease. Many cases however occurred where the mildness of the complaint rendered bleeding and almost every other remedy unnecessary.

The Saline Mixture with a small addition of Tartar Emetic, was of signal service. It acted as a diuretic, sudorific and gentle laxative. Immersion of the feet and legs in warm water, often promoted perspiration and a tendency to sleep. A Gargle of red wine and water was useful in washing off any mucous sloughs. The judicious application of these remedies, with plenty of diluents, and the antiphlogistic regimen seldom or never failed to produce the most happy effects.

Nearly about the same time, the Small Pox (see table No V.) began to rage with great violence. As the persons affected with this disease were chiefly of the lower class, who seldom called in medical assistance, it is impossible to ascertain the precise number: from the information however which I have had, it appears, that about 300, were during the last six months of the year, seized with the Small Pox in the natural way. Of these no less than 90 fell victims to its virulence. Hence near one in three died of all that were affected with the natural Small Pox, which while at the same time it serves as a melancholy proof of its fatal effects, points out the great and salutary advantages which are derived from inoculation. During the same period several hundreds were inoculated in the neighbourhood of *CARLISLE*, and it is a pleasing truth, that not one of them died. Had those 300 been inoculated it is more than probable that of the 90 not above 6 would have died, and even these not of inoculation but of other disorders. Hence we see 84 persons might have been saved to their parents and the public. Yet so great is the prejudice against the salutary practice of inoculation amongst the vulgar, that few, very few, can be prevailed upon either by promises, rewards, or intreaties to submit to the operation. No wonder that in rude, ignorant, and barbarous times, superstition hurried men into the grossest absurdities; when in a polished and enlightened age; in an age too, when the experience of full twenty years has clearly demonstrated the utility of inoculation, we see the bulk of mankind ready to sacrifice their children and all that is dear to them, to a foolish prejudice.

T A B L E I.

houses fami. males fema. Total of

both sexes

	208	319	639	732	1371
English-Street	-	-	-	-	-
Scotch-Street	-	-	-	-	-
Fisher-Street	-	-	-	-	-
Castle-Street	-	-	-	-	-
Abbey and Annet-Well Street	77	121	173	270	443
The Abbey	8	8	17	31	48
Botchard-Gate	95	202	385	457	842
Richard-Gate	82	177	307	356	663
Caldew-Gate	165	356	592	698	1290
New-Town	16	19	40	52	92
Haraby	9	10	31	41	72
Carleton	30	30	66	67	133
Wreay	17	18	56	58	114
Brisco	32	34	107	85	192
Botchardby	21	22	46	52	98
Uprightby	20	21	35	54	89
Bleck-hill	63	64	176	178	354
Cummerdale	22	22	60	50	110
Morton-Head and Newby	27	27	57	77	124
Total in the two Parishes	1148	1872	3591	4186	7677

Total within }
the walls }
houses 549 families 870 inhabit. 3504

total without }
the walls }
342 735 2795

total in the }
villages }
257 267 1378

1148 1872 7677

Females exceed Males 595
Males to Females as 1 is to 1 and
1 sixth nearly.

TABLE II.

Of the Number of Husbands, Wives, &c.

	Husbands	Wives	Widowers	Widows	Total of persons who are or have been married	
Within the walls	531	569	46	248	Total of persons who are married	3073
Without the walls	488	522	45	160	Total of persons who never were married	2489
In the villages	188	191	17	68	Total of unmarried persons	4604
	1207	1282	108	476	Widows exceed Widowers	5188
					Widowers to Widows, as 1 is to 4 and 3 sevenths nearly.	368

TABLE III.

Of the number of Inhabitants of different ages.

	under 5 years	betw. 5 & 10 years	10 & 15	15 & 20	20 & 30	30 & 40	40 & 50	50 & 60	60 & 70	70 & 80	80 & 90	90 & 100	100 & 105	total
Within the City and Suburbs	859	731	587	543	1030	733	729	498	375	164	44	5	1	6299
In the Villages	170	177	128	132	298	144	129	90	63	27	14	5	1	1378
Total	1029	908	715	675	1328	877	858	588	438	191	58	10	2	7677

TABLE IV.

Of Deaths, Ages, and Conditions.

Ages	males	fema.	Ages.	Batch.	Husb.	wido	maids	wives	wid	Total
Under 1 month	6	7								
Betw. 1-2 mon.	2		20-30	2	3		3	3	1	12
2-3		2	30-40		3			3		6
3-6	5		40-50		4		2	2	1	9
6-9	2	4	50-60	1	4	2		2	1	10
9-12	10	9	60-70		11	1	1	4	1	18
1-2 years old	21	12	70-80		3	3	1		7	14
2-3	17	19	80-90		1	3	1	1	0	12
3-4	10	8	90-100				1	1		2
4-5	6	10	total of ages & cond:	3	29	9	9	16	17	83
5-10	7	7								
10-15	4	3								
15-20	2	2								
Total of the above Ages	92	83								

Total of ages { Males 92 }
under 20 years { Females 83 } 175

Total of all Ages and Conditions 258

B

	3	1	1	1	6	9	10	18	14	12	2	4
Looseness (57)												
Infantry (63)												
III. DISEASES OF THE HABIT.												
Weakness of Infancy (65)	9											9
Decay of Age (66)								4	6	11	2	23
Dropsy (71)						1		2				3
Dropsy of the Head (72)			1									1
Dropsy of the Belly (75)		1										2
King's Evil (80)		1										1
IV. LOCAL DISEASES.												
A Discharge of Blood (102)						1						1
Costiveness (107)	1											1
Tumour of the Stomach (113)							1					1
Ulcer (128)						1						1
Difficult Delivery					1							2
Unknown Diseases	6		1			2	2	7	3	1		24
Accidents	1		1		2							4
Total	150	14	7	4	12	6	9	10	18	14	12	258

* Cullen's Genera Morborum.

T A B L E V.

Deaths and Diseases of Persons of Different Ages.

D I S E A S E S.	under betw											total
	5	5 & 10	10 & 15	15 & 20	20 & 30	30 & 40	40 & 50	50 & 60	60 & 70	70 & 80	80 & 90	90 & 100
I. FEBRILE DISEASES.	years	years	years	years	years	years	years	years	years	years	years	years
Inflammatory Fever (G. 4*)	3											3
Nervous Fever (G. 5, 6)	1			1		1	1					5
Pleurisy (G. 12)								1	1			2
Inflammation of the stomach from a large dose of Steel filings (G. 15)			1									1
Rheumatism Chronic (G. 22)									1			1
Gout (G. 23)								1		1		2
Small Pox (26)	86	2	1		1							90
Miliary Fever (29)					1							1
Scarlet Fever (30)	31	4	2	1	1							39
Thrush (33)	2											2
Consumption (35)	3	2	1	1	5		2	3				17
Worm Fever	2	4										6
II. NERVOUS DISEASES.												
Palsy (41)								1		1		2
Swoon or Fainting (42)							1			1		2
Indigestion (43)									1			1
Convulsions (48)												
Loofencis (57)	3									1		4
Infantiv (62)						1						1

TABLE VI.

Deaths in	males.	females	Total	Total of Deaths in each Season.
January,	4	7	11	33 Winter.
February.	6	4	10	
March	6	6	12	
April,	6	3	9	34 Spring.
May,	7	10	17	
June,	5	3	8	
July,	7	7	14	75 Summer.
August	14	5	19	
September,	20	22	42	
October,	30	23	53	116 Autumn.
November,	18	20	38	
December.	10	15	25	
Total	133	125	258	

Christenings,	Males.	females	Total
	102	109	211

N. B. The Christenings are by no means accurate, many of the Dissenters not being registered.